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Before the

FEDERAL COMMUNICATIONS COMMISSION

Washington, D.C. 20554

In the Matter of	)	
	)	
Nondiscrimination in the Distribution of	)	
Interactive Television Services Over Cable	)	CS Docket No. 01-7
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COMMENTS OF CANAL+ TECHNOLOGIES

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EXECUTIVE SUMMARY

Canal+ Technologies is a global technology provider for Interactive Television ("ITV") services. With its vast experience in developing and deploying ITV systems around the world, Canal+ Technologies is pleased to be able to share its informed views on many of the issues set forth in the Federal Communications Commission's (the "Commission" or "FCC") Notice of Inquiry on ITV[1]. Canal+ Technologies fully appreciates the Commission's endeavor to initiate comment and gather information on how to fully understand the deployment of ITV and its services and features. As the FCC has noted, widespread deployment of ITV will be of tremendous value to consumers.

The ITV industry is at a nascent stage. With technology and business models evolving at a rapid pace, it is difficult to provide a clear definition of ITV services. In light of this pace of development, Canal+ Technologies endorses the Commission's proposed definition as broad enough to permit the technology and industry to develop naturally. Canal+ Technologies also believes that the three basic building blocks for ITV are: a video stream, a two-way connection, and specialized customer premises equipment.[2] Canal+ Technologies recommends that Personal Video Recorders ("PVRs") and Electronic Programming Guides ("EPGs") also be included in the definition of ITV services.

Canal+ Technologies cautions the Commission against putting significant weight behind the Advanced Television Enhancement Forum ("ATVEF") protocol, and recommends against including it in the definition of ITV services. The ATVEF protocol is limiting and restrictive.

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1 *Notice of Inquiry*, In the Matter of Nondiscrimination in the Distribution of Interactive Television Services Over Cable, CS Docket No. 01-7 (released January 18, 2001) (the "Notice").

2 Canal+ Technologies believes that "video," while not mandatory, is a pivotal building block of ITV services.

We advocate developing a standard that is interoperable and fully integrated with a wide variety of technical standards, such as ATSC and OpenCable.

Canal+ Technologies believes that the ITV landscape is comprised of four key players: content owners, network operators, equipment manufacturers and ITV viewers. The first three players are entities which are or may become ITV service providers. Content owners which currently provide traditional A/V content, will evolve to include interactive features; the network operators are the de-facto ITV service providers, having already initiated and launched ITV services; and the equipment manufacturers may begin to offer ITV services by embedding ITV features directly into televisions and set-top boxes ("STBs"). Of course, all of these entities will be impacted by standards and regulatory bodies, application development tools and solutions, infrastructure providers and the development of embedded hardware and software.

With regard to the status of the ITV market, Canal+ Technologies recommends that the Commission consider the development of the European ITV industry. Although in Europe a TV-centric approach is driving the ITV market (as opposed to a web-centric approach in the U.S.), we believe Internet and television technologies are converging, thereby creating a simple content-based ITV service.

The Commission has queried whether the modern cable platform is likely to be the superior platform for the distribution of ITV services. Today, only cable TV platforms have high upstream and downstream capacity. However, current ITV applications do not required high upstream bandwidth. In addition, Canal+ Technologies' experience in Europe establishes that, in addition to cable, ITV services may also be deployed successfully via satellite and terrestrial platforms. Canal+ Technologies supports this multi-platform approach and proposes that regulators refrain from supporting one platform over another. Canal+ Technologies believes that

customizing technology to adapt to multiple platforms and standards will lead to a single type of STB that will be affordable and available to a wide variety of consumers.[3]

Canal+ Technologies appreciates the Commission's concern that ITV services might evolve in a way that will make access to a high speed connection a "must have". However, there is widespread evidence, particularly in Europe, that ITV services are being deployed without a high-speed upstream connection. Therefore, we believe that such a connection is not a requirement at present. In addition, we believe that Direct Broadcast Satellite ("DBS"), Digital Terrestrial ("DT") systems and Digital Subscriber Lines ("DSL") have sufficient bandwidth to support current ITV services. However, Canal+ Technologies recognizes that higher upstream bandwidth might be needed for fully deployed ITV services.

Regarding non-discrimination, Canal+ Technologies espouses the development of open technical standards and interoperability for the delivery of ITV services. In that regard, although we do not believe that ITV service providers should be subject to non-discrimination requirements *per se*, we firmly believe that the adoption of an "open" system will discourage discrimination and market domination in the ITV services market.

Finally, Canal+ Technologies believes that the Commission should not implement regulations regarding ITV at this time. While the ITV industry is developing both from a technological and business standpoint, the Commission should allow market forces, and the interaction and cooperation between industry players, to facilitate the growth of a burgeoning and exciting new technology.

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[3] Technical descriptions of Canal+ Technologies' distribution system is included in the text.

I. INTRODUCTION

Canal+ US Technologies, the U.S. subsidiary of Paris-based Canal+Technologies SA (collectively referred to as "Canal+ Technologies"), is a leading edge technology provider with over four years of experience working with operators in the deployment and operation of enhanced ITV services, including CanalSatellite in France, Spain and Northern Europe. Canal+ Technologies is backed by both one of Europe's largest pay-TV providers (Canal+ Group) and one of the world's leading media and communications companies (Vivendi Universal). In light of its unique profile, Canal+ Technologies is eager to share its experience and expertise with the Commission, as it considers the issues set forth in its *Notice*.

Canal+ Technologies is a provider of digital and interactive TV software solutions offering a wide range of field-proven, flexible systems for digital satellite, cable and terrestrial network operators. Canal+ Technologies' ITV products are deployed in over 8.6 million STBs worldwide, including in the United States.

As a leading middleware provider, Canal+ Technologies has developed and implemented a product called MediaHighway™, a flexible middleware solution that runs independently on the operating system and hardware platform. As an open system, MediaHighway integrates specific requirements and standards, such as those established by Digital Video Broadcasting ("DVB"), OpenCable, Advanced Television Systems Committee ("ATSC") and Digital Audio-Visual Council ("DAVIC "). MediaHighway is one of the first commercially-deployed middleware in the U.S. that supports ITV applications written in the Java™ programming language. Additionally, MediaHighway can run applications written in HTML (Hypertext Markup Language) and MHEG-5 (Multimedia & Hypermedia Expert Group).

As an ITV software solution provider, Canal+ Technologies offers a broad portfolio of interactive, multimedia applications and Internet-based services running on top of MediaHighway. Viewers can experience a variety of services on their television sets, including pay-per-view, home shopping, interactive weather reports, fast Internet access, PC software downloads, local information services, financial portal access, video games and other television commerce ("t-commerce") revenue-generating applications and services.

Canal+ Technologies has been promoting open and interoperable standards fostering competition between technology providers since April 1996. The company implemented conditional access interoperability solutions based on the DVB-Simulcrypt scheme and was first to publish an Application Program Interface ("API") based on the Java™ programming language. Canal+ Technologies' MediaHighway middleware is offered in different versions complying with international standards.

Canal+ Technologies' first-hand experience in developing and deploying ITV systems worldwide will provide the FCC with an insider's view to such questions as: what services constitute ITV services; what entities constitute ITV service providers; how will ITV services be delivered; what business models will govern the delivery of ITV services to consumers; and the general status of an ITV services market. Moreover, when the *Notice* addresses the question of whether, at least in the near term, the modern cable television plant is likely to be the superior platform for distribution of high speed ITV services, our unique experience with deployed cable, satellite and terrestrial systems in Europe, Asia and North America allows us to offer the FCC a well-documented view.

II. DEFINING ITV SERVICES

In Section II of the *Notice*, the Commission inquires into the nature of ITV services and requests input on the appropriate definition of ITV services and service providers. In particular, the *Notice* seeks comment on what services constitute ITV services, what entities constitute ITV providers, and the general status of the ITV services market.

A. What Constitutes ITV Services?

The television world is preparing for a major change -- as it moves simultaneously from analog to digital -- which will require that it approach the viewer in a different way. Historically a passive activity, the television viewing experience will become active, allowing the consumer to order movies, look up weather information, read local news, and shop on-line, all at the time of their choice. As already acknowledged by the FCC, ITV is a rapidly developing industry that could provide tremendous value to American consumers. ITV services will offer increased viewer control of the television viewing experience; integration of video and data services, including web content; real-time interaction with other viewers; and t-commerce.

Recognizing the rapid technological change which is the hallmark of the industry, the Commission offers the following definition of ITV services: "ITV is a service the supports subscriber-initiated choices or actions that are related to one or more video programming streams."[4] Appropriately, the Commission has presented a broad definition, intended to capture the ever-expanding array of services that can be ultimately offered as part of an ITV service:

[4] *Notice* at ¶ 6.

from electronic programming guides, to selecting viewing vantage points, to making on-line purchases.

The nature of ITV services is evolving swiftly, with constant and continuous technological changes and evolving business models. Therefore, it is difficult at this stage to provide a clear and definitive definition of ITV services. Canal+ Technologies endorses the Commission's proposed definition as sufficiently broad and flexible to permit the technology and the industry to develop naturally, without being constrained by a limiting characterization. As a point of reference and interest, a definition provided by a research agency[5] states that, "ITV is a digital broadcast link to a return path that enables consumers to send and receive individualized messages in real time on their television set."

Canal+ Technologies appreciates the effort made by the FCC to gather data to support a well-documented characterization of ITV services. Certainly, Canal+ Technologies agrees that the three basic building blocks for ITV are: a video stream, a two-way connection, and specialized customer premises equipment. At heart, ITV services are entertainment-based services which will largely revolve around a video signal. This is consistent with our experience in Europe, where the majority of ITV services are associated with a video signal. Non-entertainment services will be found on PC-based networks and applications. While ITV certainly marries the interactivity found on the Internet, it is also fundamentally video-driven as an application. Therefore, we believe it is appropriate to include video as a pivotal, while not mandatory, building block of ITV services.

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[5] The Forrester Report, "Smarter Television", July 2000.

The Commission also asks whether other services, such as PVRs, should be included in the definition of ITV. Canal+ Technologies believes that PVR functionality has the potential to significantly change the viewing patterns and usage of the average television viewer. While this technology is not yet widely deployed, it currently has attained a high degree of attention from consumer equipment ("CE") manufacturers, middleware providers, network operators and, most importantly, the content and advertising community. Therefore, we believe the FCC definition of ITV services should include PVR as an application.

Canal+ Technologies also believes that EPG is a critical application for the ITV subscriber. Based on our deployment experience in Europe, we have found that the navigator, or EPG, is one of the most popular applications used by viewers.

However, Canal+ Technologies does not believe that the ATVEF protocol should be included in the definition of ITV services. While a lot of attention has surrounded the work of ATVEF, it is not being deployed in volume today. ATVEF is currently being presented as an alternative to deliver Internet services on TV. However, a detailed review of ATVEF specifications shows that ATVEF is more a continuation of HTML, rather than a true evolution taking into account the constraints of the TV environment. The only feature the ATVEF protocol adds is a coarse-grained synchronization mechanism for Audio/Video ("A/V") content and a User Reference Interface ("URI") mechanism for referencing TV Channels. For instance, creating an EPG, or managing the digital content of a hard disc inside the STB for PVR functionalities, cannot be implemented using ATVEF.

A truly robust specification, targeted specifically for the TV environment, and integrated with the other TV-related technologies, is therefore still required. We believe that it would be dangerous to restrict the definition of ITV services by referencing the ATVEF specifications.

Instead, Canal+ Technologies believes that the industry should focus on defining a fully featured set of APIs, based on a Java/HTML solution and enabling each deployed application to fully benefit from the hardware resources of the STB. Such a move is already happening in the U.S. with the work done by ATSC and OpenCable, as well as in Europe with DVB.

B. Which Entities Should Be Classified as ITV Providers?

The *Notice* asks if it would be accurate to distinguish between those providers whose downstream ITV enhancement content will be packaged with video signals and those providers whose downstream content will be independently delivered.[6] Further, in those cases where ITV enhancements are associated with a video signal, the *Notice* queries if it is reasonable to assume that carriage of the enhancements by cable operators will be negotiated between the video programming provider and the cable system.[7]

Canal+ Technologies believes that the ITV landscape is comprised of key players who fall within specific segments of the ITV Value Chain. This Value Chain, as described in Figure II.1, is comprised of four primary elements, and then four key enablers. The primary chain is Content to Network Operators to CE OEMs to TV Viewers in their homes. It is to the elements in this primary chain that the key objectives are set. There are four Key Enablers that both directly and indirectly shape the four key chain elements, as well as help accelerate and smoothen, or slow down and hinder, the flow of the overall Chain. As noted from the Value Chain, entities that fall within each category of the Primary Chain are many and varied.

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6 *Notice* at ¶ 17.

7 *Id.*

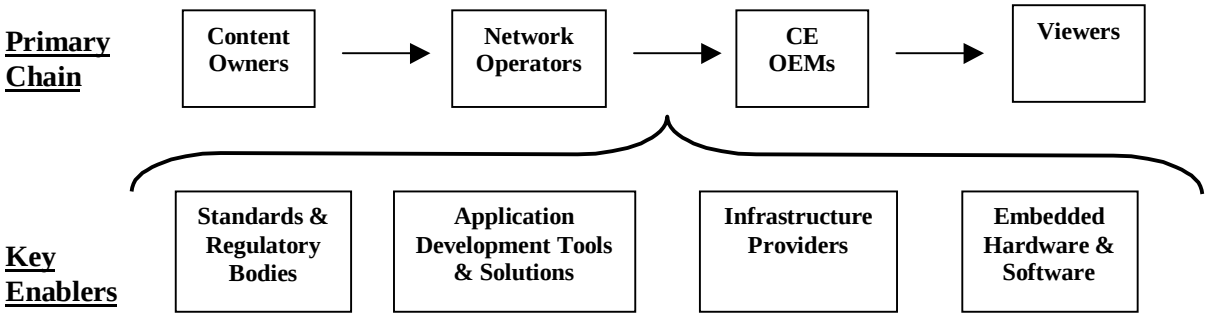

Figure II.1 – ITV Value Chain

While the key enablers need to cooperate to make ITV a reality, Canal+ Technologies believes that the primary chain addresses accurately the entities which may become ITV service providers.

The content owners are today providing the traditional A/V content. As ITV becomes more popular, content will evolve to include interactivity. This interactivity may be delivered in multiple formats (*e.g.*, embedded inside the video stream, separate data stream along the MPEG stream, etc). However, as soon as the content is delivered with data enabling any type of interactive services, the content provider will become an ITV service provider. In parallel, a new generation of "pure interactive" content providers will emerge so as to provide new services to consumers.

The network operator is the de-facto ITV service provider. Several have already initiated this process by launching ITV service trials including PVR and video-on-demand ("VOD") services. In the early stage of ITV deployment, the network operators are going to be the primary drivers since ITV services provide them a way to differentiate their offerings and, potentially, increase their revenue.

Regarding the CE companies, as the STB market moves into the retail environment, it offers them an opportunity to become ITV service providers. Analog TV sets embedding an

EPG is an early example of a CE product offering an added value to a service. Once STBs are readily available in the retail market, like VCRs are today, the CE companies will be able to embed services into the TV sets and become ITV service providers.

Canal+ Technologies would be happy to provide to the Commission additional information and detail related to the ITV Value Chain.

C. What is the General Status of the ITV Market?

ITV has become a swiftly growing reality in most international markets. With the rise of Internet services on mobile phones, futuristic visions of a networked economy are quickly becoming a deployed reality. The emergence of these new interactive platforms fundamentally alters the old exclusively PC-based e-commerce economy.

The U.S. ITV market is still in its infancy. Therefore, it may be worthwhile to look to the experience in Europe and the state of the European ITV market today after four years of operation -- since 1997 is considered by many as year one for the launch of ITV and enhanced TV in Europe. It is estimated that, by 2003, more than 30% of the existing 150 million TV households in Europe will receive digital television ("DTV") services and, in most cases, ITV services. While PC-based Web markets trail behind the US, ITV and smart phones are already a commercial reality in several European markets.[8] This should provide U.S. ventures an early glimpse into a truly networked, interactive economy.

While ITV sits at the intersection of the Internet and television, it is interesting to note that the ITV industry in Europe is developing quite differently from its U.S. counterpart.

[8] IDATE, Development of Digital Television in the European Union, Ref Report 1999, Final Report June 2000 ("IDATE Report").

European ITV is TV-centric – driven by pay-TV broadcasters[9] requiring specifically-developed applications which help enhance and extend the TV experience. In the U.S., on the other hand, ITV appears to be more Web-centric – driven by the Internet industry using HTML-based enhanced TV, focusing on delivering Web access to TV. Canal+ Technologies believes that the two markets are presently converging toward content-based ITV services, rather than unedited web-access.

ITV enhances the competitive landscape by displacing entrenched players, rearranging players, and creating new players. ITV also drives major changes in consumer behavior. Although interactive content will not transform passive couch potatoes into active Web surfers, it is expected to change the consumer's behavior in the following ways:

- Viewers will not only program surf but will also switch from ads to shows, to interactive content, to commerce functions.
- Viewers will participate in TV game shows.
- Viewers will have access to weather reports, stock quotes, headline news, and commodity data, alleviating the need to log on the Internet or to read newspapers to get this type of information.
- Statistics and in-depth commentary will supplement sports events and other shows.

The introduction of DTV in Europe has resulted in obvious changes in its television market structure. New pay-TV platforms have appeared. For instance, between December 1998 and June 1999, the number increased from twenty (20) to thirty-five (35). Additionally, numerous new TV channels have emerged, with more than 400 digitally broadcast channels by

[9] Throughout this document, the term "broadcaster" refers to the platform operators, regardless of whether they are cable, satellite (e.g., DBS) or digital terrestrial.

the end of 1999.[10] Although the innovative appeal of DTV remains rather difficult to demonstrate in certain European markets, it is undeniable that digital technology has brought about new types of services. For instance, DTV has brought massive innovation in the TV marketing and TV packaging domains. In most countries, the TV offering is now richer, more segmented and varied. Although films and sports programs are usually perceived as the main attractions, 280 new thematic channels have been created since 1996, with 104 created in 1998 alone.[11] Apart from these new channels -- created thanks to the increased capacity offered by digital technology -- ITV is certainly seen as vital to DTV and to the increasing convergence of the TV, Internet and computer worlds. To date, virtually all of the DTV platforms in the major European markets include new ITV services. Except for pay-per-view service, ITV offerings are usually built around such services as EPG, e-commerce, TV-banking, information and news, travel reservations, interactive games, e-mail functions and high-speed Internet access via the TV. Adoption of ITV in Europe has been so strong that it is believed that, by 2005, more Europeans will use ITV than go on-line with a PC.

III. DISTRIBUTION OF ITV SERVICES

In the *Notice*, the Commission seeks comment on the technical description of distribution platform functionality. In particular, the Commission is concerned about the ability of ITV services to be offered over a "hybrid platform" such as cable, satellite/DBS, or DSL-enhanced terrestrial systems.[12] The Commission queries whether it is practical to believe that

[10] IDATE Report.

[11] IDATE Report..

[12] *Notice* at ¶ 20.

independent ITV service providers will be able to bypass cable systems and provide high quality ITV services.

A. Technical Description of the Distribution Platform Functionality.

As noted earlier, Canal+ Technologies support a multi-platform distribution approach to ITV. Such an approach is fully supported by the experience in Europe where ITV services are being offered over cable, satellite and terrestrial systems. While a digital terrestrial broadcast platform for ITV is not as advanced as cable and satellite, as the broadcasting industry transitions its plant from analog to digital, ITV deployment is becoming a reality. Certainly, all of these distribution platforms should be permitted to deploy ITV services and regulators should not support one over the other, regardless of whether functionality differs depending upon the particular delivery platform. As a middleware provider, Canal+ Technologies is committed to customizing its middleware solutions to adapt to multiple standards. This multiple implementation strategy is designed to develop a single, affordable, STB that can access all the features of ITV.

The type of interactivity which has been deployed by most of the platforms so far can be described as follows:

- One way: As a basic interactive service, EPG applications does not need a return path.
- Local: Simple games and enhanced content are broadcast along with the video stream, are stored locally, and will not require a return path.
- Two-way: Interactive advertising, shopping and banking require a return path to process transactions.
- Real-time: Services, such as multiplayer games, will require a continuously open modem. In such instances, IP connectivity is beneficial.

The main elements of a distribution system are shown in Figure III.1. An application development tool will provide ITV applications and related data to an Object Carousel Generator ("OCG") which will packetize appropriately the data before injecting such data into the Multiplexer equipment. The Multiplexer will generate the MPEG packets to be transmitted via the radio frequency ("RF") link to the digital TV and STB.

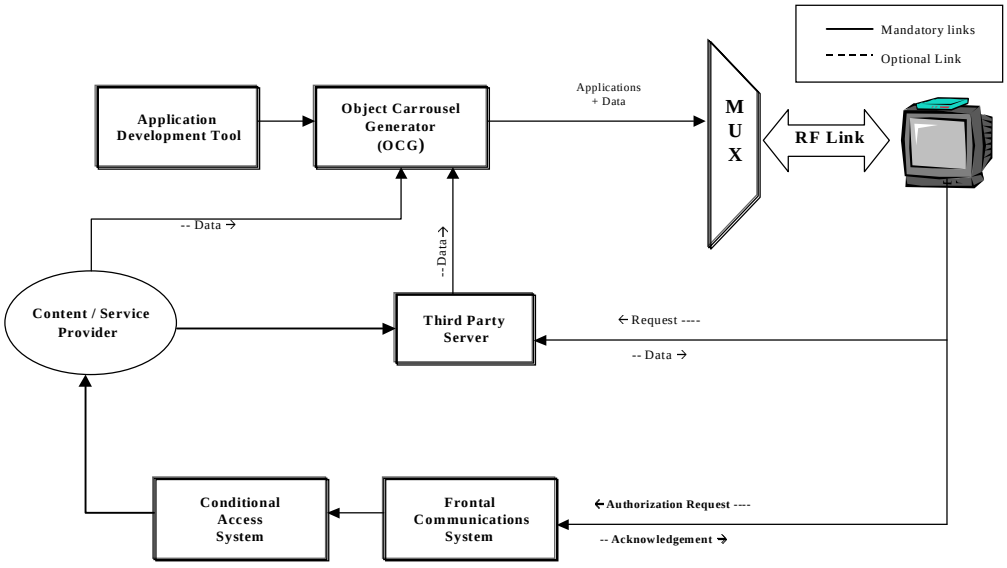

Figure III.1 – ITV Service Distribution System (General Diagram)

In the case of ITV services, such as pay-per-view or t-commerce, the return path can be used to validate a purchase on-line. The request will be sent to a frontal communications system that will demodulate the embedded request and distribute it to the Conditional Access System ("CAS") for authentication. After validation, the CAS will provide the request to the content/service provider for recording and processing of the request as well as billing the customer appropriately.

For ITV services such as interactive ads or downloading games, the return path will be used to send a request for further information or a new game to a third party server in charge of the dedicated service. When the request is validated, the required data will be sent to the customer either directly via the upstream link (in the case of a Cable system), or the third party server will send the data to the carousel generator so as to provide the data to the appropriate customer via the RF link (*i.e.*, in-band, in the case of satellite and terrestrial systems). The Content/Service provider is continuously linked to the third party server so as to maintain the server database up to date.

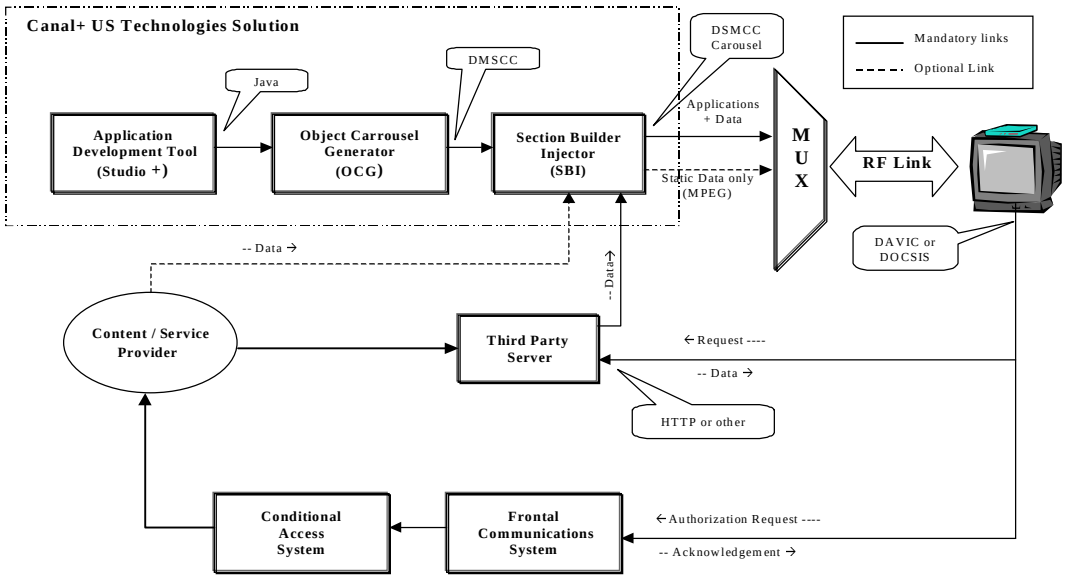

Figure III.2 – ITV Service Distribution System (Canal+ Technologies Solution)

Canal+ Technologies' ITV system configuration is shown on Figure III.2. Even though the concept is identical to what has been described in Figure III.1, the implementation of open standards was favored, whenever possible. Any Java-based Integrated Development Environment ("IDE") can be used to create an application. Once created, the application is sent

to an OCG, which is in charge of signaling, authenticating and inserting applications into a carousel according to a widely used standard: the Digital Storage Media - Command and Control ("DSM-CC")[13] protocol. The OCG is specially designed to broadcast applications that can be seen as a file system. The OCG automatically generates sections to carry the carousel and the related signaling information. It does this based on the defined service plan and the broadcast profile delivered by the authoring tool. The generated object carousel sections and the signaling information are sent to the equipment in charge of the broadcast management, the Canal+ Technologies Section Broadcaster and Injector ("SBI").

The SBI is a MPEG2 broadcaster that carousels or injects in real-time MPEG2 sections into a MPEG2 multiplexer. The SBI is a Transmission Control Protocol/Internet Protocol ("TCP/IP") server which receives private data from one or several clients and manages the broadcast of that data to the appropriate multiplexer(s) within the correct format, stream, bit rate and signaling. The SBI can be used to broadcast long lifetime data in a carousel way (*e.g.*, interactive applications), or very short lifetime data in a one shot session (*e.g.*, synchronization between video and interactive applications, stock exchange data, etc.).

On Figure III.2, the return path can be based on a telephone modem, Data Over Cable Service Interface Specifications ("DOCSIS") or DAVIC protocols, and data provided by the third party server can be accessed using HTTP or any other acceptable protocol.

In such a design, since most equipment is not proprietary, most off-the-shelf components can be used. Content providers – broadcasters, advertisers and merchants – who strongly believe in ITV have had to cope so far with multiple proprietary and, therefore, incompatible systems.

[13] ISO/IEC 13818-6: Information technology – Generic coding of moving pictures and associated audio information: Extension for Digital Storage Media Command and Control.

To leverage this pressure, content providers will have to keep the backend systems platform-neutral and tap creative agencies to develop compelling ITV services.

New standards have been developed to make API interoperable. DVB currently aims to establish a single, integrated ITV standard: the Multimedia Home Platform ("MHP'). To match the speed of technological change which will defeat any attempt for a monolithic specification, MHP will include a dynamic collection of Net and Video standards, such as HTML, SMIL, JavaScript, and PersonalJava. The implementation of such standards will help:

- STB manufacturers to create a market for off-the-shelf STBs, *e.g.*, boxes that could be purchased from retailers.
- Broadcasters to operate cross-platform services since standardization will enable them to produce interactive services for multiple platforms at a lower cost.

Following the above strategy, U.S. standards consortia such as OpenCable and ATSC are doing similar work on HTML and Java-based specifications. Canal+ Technologies believes that, eventually, all APIs will converge toward one single API format.

B. Technical Resources Needed by a Distribution System to Support ITV.

As addressed earlier, the fast development of ITV services will require dedicated resources, as well as appropriate protocols and standards that are unanimously accepted by the ITV community. An interactive STB, either stand-alone or integrated, is ultimately necessary. Since ITV is becoming an integral part of the TV experience, all future STBs, or even Integrated Digital TV (iDTV), will contain all the necessary functionality to support any kind of ITV services and applications. For instance, virtually all of the DTV platforms in the major European markets already include integrated STBs. Moreover, a specialized STB for ITV services is not

financially practical and is not consumer-friendly. Consumers want one STB – integrated or not in their DTV set -- that will access a multitude of services, including ITV.

Integrated STBs deployed by network operators will initially be used to offer services in walled garden environments. Once APIs are standard and STBs are fully deployed, the walled garden approach will fade. The commercial reality is that network providers will provide interactivity as part of their video services, because consumers will demand it. If APIs are standard and STBs are deployed, then independent ITV providers can run their applications.

Currently, ITV services in Europe exist within a "walled garden". By the end of 2000, such walled garden offerings reached nearly 14 million subscribers.[14] A "walled garden" approach offers decided benefits in contrast to systems which provide unedited Internet access. Walled-garden ITV uses low cost technology and limits content to a selected set of offerings. In the case of Canal+ Technologies, such content is provided by Canal+ Technologies itself and by independent content providers. Further, there is continuous input from the customer to tailor and change offerings to the customer's particular needs and desires.

One of the advantages of the walled garden approach is that it creates a non-threatening environment (in comparison with the huge, sometimes frightful amount of data which can be accessed on the Internet). By ensuring that there is non-discrimination in the content that is offered, consumers, content providers, technology providers and network platform owners all benefit. As a result, the walled garden approach progressively teaches users a more constructive and satisfying way to consume ITV services. Low cost STBs, limited functionality, simple APIs, and limited content follow a consistent "less is better" logic. The creation of TV-centric

[14] Forrester Report, "Europe's iDTV Walls Come Down", February 2000.

services, more focused on entertainment than provision of raw and cold information, also eases the transition to interactivity.

C. Will ITV Services Evolve in a Way That Will Make Access to a High Speed Connection Necessary?

In the *Notice*, the Commission seeks comment on whether significant bandwidth will be required for ITV services. Specifically, the *Notice* reads:

> …With regard to upstream capacity, cable operators are increasingly offering high speed Internet connections via cable modems in addition to their substantial downstream video capacity. DBS services currently offer hybrid Internet services, with a high-speed downstream connection via satellite and a dialup telephone connection for upstream transmissions…. High-speed Internet service is also available over wireline telephone plant using DSL technology…. In particular, the DSL family of technologies does not support sufficient downstream bandwidth to provide the full range of expected ITV services, including multi-channel high quality video transmission. Digital terrestrial television licensees have sufficient capacity to transmit ITV enhancements as part of their 19 Mbps digital datastream, but have no integrated upstream capacity. Furthermore, this downstream capacity appears to be insignificant when compared to the capacity of a multichannel cable system that services customers through nodes serving 500-2,000 subscribers...[15]

The Commission's observations reflect a real concern that ITV services might evolve in a way that will make access to a high speed connection a "must have". At this stage, when analyzing the European market and the present applications running on several successfully deployed satellite and terrestrial platforms, it appears that compelling applications have been launched without the support of a high-speed upstream connection. In fact, some thirty or so successful ITV services and applications have been running for almost four years on satellite platforms such as CanalSatellite, using only a 9600 bit per second ("bps") modem. It is

[15] *Notice* at ¶ 19.

important to note, however, that applications which would require high bandwidth for both upstream and downstream are not available on the market today. Moreover, if one reviews the Internet market in view of converting the available applications for the TV market, none of them would actually require high speed upstream connection. On a cable platform, the return channel is based on DAVIC or DOCSIS, offering both high upstream and downstream bandwidth connections.

Based on the above, Canal+ Technologies does not believe that high upstream bandwidth is a key differentiator today, and potentially for at least the next three years. However, such high upstream connectivity could become critical for fully deployed ITV services.

IV. NON-DISCRIMINATION ISSUES

A. Does the Lack of a Satisfactory Upstream Channel for Direct Broadcast Satellite and Digital Terrestrial TV and the Bandwidth Constraints of Digital Subscriber Line Provide the Cable Platform with Significant Advantages?

As noted above, based on several years of experience in the deployment of ITV applications and services, Canal+ Technologies believes that significant additional bandwidth is not necessary to deploy ITV services. This conclusion would tend to discard any argument emphasizing the advantage of the cable platform over DBS and DT systems. For the same reasons, we also believe that DSL performance is more than adequate to support the ITV market.

As a side note, the traditional view which says that the absence of a direct return channel handicaps Internet access via satellite is short lived as several geostationary satellite operators will offer businesses a direct return path via satellite as early as 2002.

B. Should ITV Providers be Subject to Non-Discrimination Requirements?

Canal+ Technologies believes non-discrimination should be the hallmark of the ITV industry. As various telecommunications and computer sectors have learned over time, proprietary/closed protocols and technologies, rather than open protocols, not only are bad public policy, but bad business. Therefore, Canal+ Technologies advocates the use of open technical standards for the creation, transport, and delivery of interactive television, as well as non-discrimination among ITV service providers in order to encourage the rapid development of new and consumer-advantageous products, applications, technologies and services.

Through the Telecommunications Act of 1996 (the "Act"),[16] Congress sought to establish a "pro-competitive, de-regulatory national policy framework designed to accelerate rapidly private sector deployment of advanced telecommunications and information technologies and services to all Americans."[17] Congress also expressed the same goal in addressing the advent of the Internet. Section 230(b) of the Act provides that it is a policy of the United States "to promote the continued development of the Internet and other interactive computer services" and to preserve the vibrant and competitive free market that presently exists for Internet and other interactive computer services, unfettered by Federal or State regulation."[18] Most recently,

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16 Pub. L. No. 104-104, 110 Stat. 56. The 1996 Act amends the Communications Act of 1934, 47 U.S.C. §§ 151 *et seq.*

17 *See*, Joint Statement of Managers, S. Conf. Rep. No. 104-230, 104th Cong., 2d Sess. 1 (1996).

18 47 U.S.C. § 230(b)(1), (2). *See also, Access Charge Reform; Price Cap Performance Review for Local Exchange Carriers; Transport Rate Structure and Pricing; End User Common Line Charges*, First Report and Order, 12 FCC Rcd 15982, 16133-344.

Congress has urged the Commission to "encourag[e] the deployment on a reasonable and timely basis of advanced telecommunications capability to all Americans."[19]

Canal+ Technologies maintains that interoperability and open standards in the provisioning of ITV services fits squarely within the Commission's goals to promote competition and innovation, and to discourage incidences of market power abuses. The failure to implement open standards may result in market domination in the ITV services market by ITV providers who are "compliant" with the more limited ITV delivery standards currently in place. Non-interoperable standards would also discourage the production of standard STBs that would be compatible with ITV services provided by all carriers, thereby preventing the desired widespread "deployment on a reasonable and timely basis of advanced telecommunications capability" to consumers.

C. ITV and Navigation Device Rules.

In the *Notice,* the Commission recognizes that discrimination can also occur in the area of customer premises equipment ("CPE") particularly with regard to navigation devices. The Commission noted that, "if the cable system is digital, then our navigation devices rules require the operator to provide a point of deployment or 'POD' module to subscribers who have purchased navigation devices at retail. Under the rules, the POD provides conditional access functions and must be able to interface with commercially available 'navigation devices' (*e.g.*, STBs) that perform all other navigation functions."[20] The Commission added that, while

[19] Section 706 of the Telecommunications Act of 1996, Pub. L. 104-104, Title VII, § 706, 110 Stat. 153, set forth at 47 U.S.C. § 157 nt.

[20] *Notice* at ¶ 35.

navigation devices (other than modems) are not yet commercially available, once they are, subscribers to digital cable systems will have the choice of purchasing a STB at retail or leasing one from the cable operator.[21] In order to access the unaffiliated ITV service, the subscriber would need to connect the ITV-STB to the cable STB provided by the cable operator.[22]

When reviewing the functional diagram for the implementation of ITV, it becomes clear that, while a "point of deployment" or "POD" offers a low level of interoperability, it does not protect against the security issues necessary to support ITV applications and services. As described earlier, a real ITV service requires the availability of a return path. Secure data will be sent to an ITV service server, and in some cases, secure data will be sent back using the same link. For such transactions, the POD does not offer secure transmissions, which is a critical requirement if one wants to convince customers to use t-commerce retailing applications and services as a truly alternative means of shopping. Also, the new STBs to be deployed soon will all include a Hard Disk Drive ("HDD"). In view of launching compelling ITV services, it is important that each ITV application can access the HDD. As defined today, the POD does not manage such a vital requirement. In the same vein, commercial transactions and content copyright management are not addressed with respect to the POD. Yet, these factors are key in enabling the success of ITV.

As a technology provider, Canal+ Technologies wants to ensure that security at all levels of the ITV transaction is available. There is a need for a solution sufficient to handle fully integrated STBs, as PODs do not provide adequate security for full ITV deployment. In sum, although the POD may meet certain requirements for which it was originally designed, it does

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[21] *Id.*

not take into account additional requirements that are necessary to facilitate the provisioning of ITV services.

V. THE COMMISSION SHOULD NOT REGULATE ITV AT THIS TIME

The Commission should not regulate the provisioning of ITV services at this time. ITV is in the early stages of development, and a wide variety of providers have entered the marketplace to stimulate competition and innovation. The development of ITV, like the Internet, should be driven by market forces, and the FCC should "continue the approach of studying new technologies and only stepping in where the purpose for which the Commission was created, protecting the public interest, demands it."[23] To that end, the Commission should continue to "refrain from regulating nascent markets and to rely, instead, on market forces."[24]

ITV technology is still being developed. For instance, there is no consensus on a preferred technical platform for the distribution of ITV or technical standards for applications to be run over the platform. Indeed, there are numerous technical standards, including HTML, TCP/IP, ATVEF, DOCSIS, OCAP, ATSC and DVB-MHP that support the ITV market. The compatibility of these varying technical standards has a direct effect on the deployment of STBs. If STBs are not compatible with the different technical standards, certain programming offered using one STB's protocol may not work with another's protocol. Thus, a determination of technical standards and the interoperability with STBs is critical in determining whether technology is robust enough to support ITV services. The industry is working cooperatively

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[22] *Id.*

[23] *See* Jason Oxman, "The FCC and the Unregulation of the Internet, " (OPP Working Paper Series No. 31, 1999).

toward formulating its own standards to determine the vibrancy and likelihood of long-term success and growth in the ITV market. Therefore, it would be premature for the Commission to impose regulations on a technology and industry that is working constructively in the public interest. Further, regulation, while well-intentioned, can result in directing a particular technical or commercial outcome which steers the technology and industry in the wrong direction.

In addition to technical standards, ITV business models, particularly for advertising and t-commerce, are also under development. Because technology and customer preferences are still at the exploratory stage, advertisers and t-commerce providers must determine how to use various interactive measurement tools and strategies to their benefit. For example, advertisers must grapple with the uncertainty of how ITV may affect traditional advertising formulas. If ITV subscribers have the capability to manipulate content, what would prevent them from by-passing advertisements altogether? Similarly, marketing and t-commerce in an interactive environment presents many new challenges. Until marketers and t-commerce vendors determine a customer's likelihood to use ITV to make purchases, it will be difficult to formulate a successful course of action. To be sure, it will take time, and trial and error, to determine how advertisers, marketers and t-commerce vendors can use interactive strategies to their advantage. Ultimately, however, the market should decide how best to proceed without regulatory interference.

Regulation of ITV is also unnecessary because a broad array of companies are entering the ITV industry thus stimulating competition, innovation and growth. Although only 5 million

[24] *See In the Matter of Local Competition and Broadband Reporting*, CC Docket No. 99-301, Memorandum Opinion and Order, 15 FCC Rcd 7717, 7768 ¶ 105 (2000).

American households, or 5 percent of the population, can interact with their televisions,[25] the success of advanced digital television services and other technologies is leading to the emergence of a fast-growing new industry comprised of ITV applications and software developers eager to build on the potential of the new platforms. Overall, companies in the broadcast, satellite, telecommunications, Internet, and cable industries, among others, are clamoring to provide ITV distribution, technology, and content. Given such developments and innovation, governmental intervention is not necessary now and, if enacted, could potentially stifle a burgeoning, competitive industry.

However, Canal+ Technologies endorses the Commission's continued diligent oversight. Certainly, Commission intervention would be appropriate in the future if there is discrimination in the development or deployment of ITV services, or the industry does not work toward open, interoperable technical standards. Such developments would not be in the public interest and would certainly warrant regulatory intervention by the FCC.

VI. CONCLUSIONS

Technology sets the scene. Aggressive marketing creates demand. Momentum builds. Consumers expect service. Such is the progression of industry-based initiative. A pro-competition and technologically-benign approach, allows a successful launch of digital cable, satellite and terrestrial platforms offering numerous creative ITV services. Such has been the experience in the U.K. for instance.

[25] Compare that with the UK, the most advanced market in the world is the UK, where 40% of homes will have interactive digital television by the end of 2001. All the UK's major digital platforms, satellite, cable and terrestrial, offer a wide range of interactive services such as interactive sports coverage, t-commerce, games, and email. Other leading European markets include Denmark (household penetration end 2001 (25%), Spain (23%) and Sweden (22%).

While, in the end, the consumer just wants to sit back and be entertained, the consumer also wants high quality service at affordable prices with flexibility to change service providers. In order to accomplish that objective, ITV systems and services need to be interoperable with open standards and non-discrimination among the players in the Value Chain.

ITV is in its infancy, with industry members working cooperatively to define the technical and commercial parameters for the service. As history has shown, such market-based initiative and cooperation redounds to the benefit of the public. Further, the market factors which would justify imposing regulation in the ITV industry are not present. Therefore, there is no problem warranting regulatory intervention by the Commission at this time. Indeed, if the Commission were to impose regulations now, it could unintentionally skew the development of the technology and the service sector. With continuous monitoring, the Commission can satisfy itself that the ITV technology and services are developing in a manner consistent with its mandate to protect the public interest.

In a healthy commercial sector, such as here, the appropriate regulatory environment is one that withholds regulation unless and until there is an affirmative reason to regulate. We fully endorse the Commission's oversight and diligence in this proceeding. Such oversight will assure that all factions in the industry will continue to work toward cooperative, interoperative systems and technologies. Canal+ Technologies views its role as enabling the key companies in the ITV Value Chain to deliver these beneficial services through our proven technology product in such a cooperative manner.

We would be very happy to provide additional commentary to the FCC as the scope of the inquiry broadens.

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